NanoTech GOLD news

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Imidazolium salts for GNP production

Scientists at the Institute of Bioengineering and Nanotechnology (IBN) have reported the first use of imidazolium salts (IMSs) to convert carbohydrates into versatile chemical compounds for biofuel production. In the first reported study of the redox properties of IMSs published in the *Journal of the American Chemical Society* IBN researchers successfully synthesized uniform gold nanoparticles within seconds at room temperature using IMSs. The ultrafine (1-2 nm) nanoparticles remained stable for up to 6 months at 4°C. Unlike conventional synthesis techniques using borane or borohydride reduction processes, IBN's method does not require any strong reducing reagent yet is able to produce gold nanoparticles under very mild reaction condition with remarkable efficiency. IBN's new synthesis protocol could easily be scaled up for industrial applications.

See L. Zhao, C. Zhang, L. Zhuo, Y. Zhang and J. Y. Ying, "Imidazolium Salts: A Mild Reducing and Antioxidative Reagent," Journal of the American Chemical Society, 130 (2008) 12586-12587.

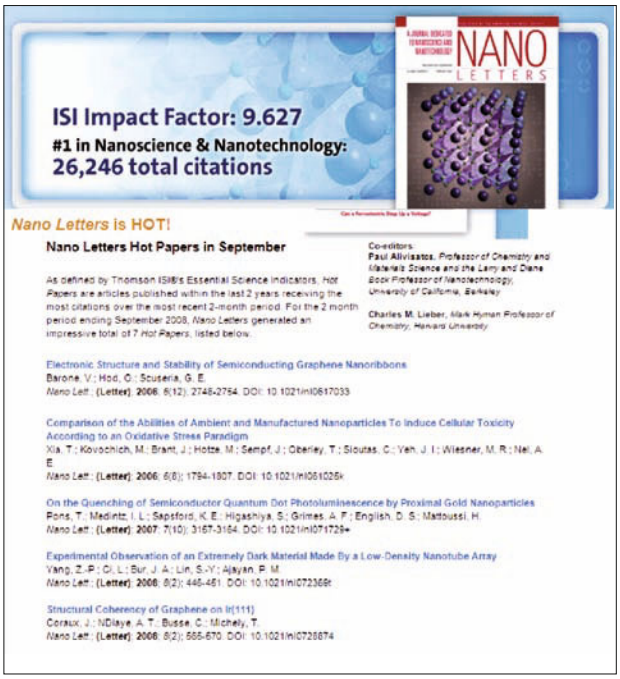
Final issue

This is the final publication of *NanoTech Gold News*. In order to improve the timeliness of the information we have included in this newsletter, we have taken the decision to move to a new online format, specifically a 'blog' called Gold Innovations.

Visit http://www.goldinnovationsblog.com

WORLD GOLD COUNCIL

Gold Nanotechnology is Hot!



As defined by Thomson ISI's Essential Science Indicators, 'Hot Papers' are articles published within the last two years receiving the largest number of citations over the most recent two-month period. For the period ending September 2008, 2 of the 7 papers published in Nano Letters that were defined as Hot Papers were focused on gold:

On the quenching of semiconductor quantum dot photoluminescence by proximal gold nanoparticles
Pons, T.; Medintz, I. L.; Sapsford, K. E.; Higashiya, S.; Grimes, A. F.; English, D. S.; Mattoussi, H.
Nano Lett.; **(Letter); 2007**; 7(10); 3157-3164. DOI: 10.1021/nl071729+

Arrays of iso-oriented gold nanobelts
Chen, Y.; Milenkovic, S.; Hassel, A. W.
Nano Lett.; **(Letter); 2008**; 8(2); 737-742. DOI: 10.1021/nl0725852

Non-cytotoxic gold nanorods for in-vivo therapeutics and imaging

Nanopartz have announced that a revolutionary new manufacturing method has been developed for their nanorod products.

This new proprietary method, removes the cytotoxic cetyl trimethylammonium bromide (CTAB) capping agent necessary for manufacturing, replacing it with polyethylene glycol (PEG). PEG has a low toxicity and is used in a variety of products. It is the basis of a number of laxatives and skin creams and many other well known products. The combination of the gold nanorods with PEG coatings, under the name *Ntracker*, has shown half-life circulation times of greater than 17 hours in mice.

For a number of years researchers have known of the advantages offered by gold nanorods for in-vivo and in-vitro applications. Gold nanorods have unprecedented photothermal absorption characteristics, efficiently converting light to heat as well as being very good light scatterers. These two properties are necessary for successful in-vivo therapeutics, imaging, and diagnostics.

However, the limitation on commercialising gold nanorods for in-vivo and in-vitro applications has been toxicity. Nanopartz now claims to have solved this problem with the release of their Ntracker nanorods

Other potential applications of gold nanorods include their use to improve the efficiency of solar cells, for use in negative refractive index materials, as well as for optical polarizers for sunglasses.

See www.nanopartz.com for more details

Midatech forms PharMida for applying gold nanotechnology

Midatech Group Ltd, a world leader in the design, synthesis and manufacture of biocompatible nanoparticles has announced the formation of a Basel-based Swiss drug development subsidiary, PharMida AG. Formation of this subsidiary follows an investment by a group of Switzerland-based private investors into Midatech Ltd. The mandate of PharMida is to develop a strong portfolio of clinically validated gold nanoparticle-drug combinations

Nano keynotes at GOLD2009

Heidelberg - The venue for GOLD 2009!

The following are confirmed invited speakers for GOLD2009 (nanotechnology). See www.gold2009.org for full details of the conference, including registration.

Paul Mulvaney, University of Melbourne
'Single gold nanocrystal spectroscopy - Steps towards active plasmonics' PLENARY LECTURE

Brahim Lounis, Université Bordeaux
'Optical detection of individual Gold Nanoparticles'

Ulrich Heiz, Technische Universität München
'Catalysis of Gold: Each atom counts!'

Didier Astruc, Université Bordeaux
'Interplay between Gold Nanoparticles and Dendrimers'

Vincent Rotello, University of Massachusetts
'Gold Nanoparticles as Diagnostics and Therapeutics'

Mikael Käll, Chalmers University of Technology
'SPR goes nano: using gold nanostructures for efficient refractive index sensing'

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